

REMARKS:

The Examiner's care in reviewing the specification and claims is greatly appreciated. Consideration of the application in view of the amendment of claims above and remarks below is respectfully requested.

5 Claim 27 has been amended and claims 28, 35-39, 44, 46 and 97 have been cancelled above. The limitation of cancelled dependent claim 35, "wherein the cardboard box is infused with the fungal inoculant and the seeds," has been incorporated into amended independent claim 27.

 Pending claims 27, 33, 34, 42, 43, 48, 98 and 99 remain rejected under
10 35 U.S.C. § 102(b) as being anticipated by US 4,589,225 (Stensaas).

 US 4,589,225 (Stensaas) is stated to disclose a delivery system intended to benefit and to fertilize crops and other plants, comprising 1) a "primary packaging" material, 2) a fungal inoculant or "propagules of MF" microorganisms and seeds. The disclosed seeds belong to generic plants
15 including crops and woody plants within the broadest meaning of claims 33 and 48.

 The disclosed fungal inoculant or "propagules of MF" include spores and mycelium or hyphae. The disclosed "MF" microorganisms are generic mycorrhizal fungi, including the ecto- and endo- forms that are capable of
20 colonizing root surfaces and root insides. Thus, the office action states, the "MF" microbial inoculant as disclosed falls within the broadest reasonable

meaning of the claimed terms “saprophytic” and “mycorrhizal fungi” of the claims 27 and 98.

Applicant would again argue that the cited patent does not disclose the use of *both* saprophytic and mycorrhizal fungi and as such cannot anticipate
5 the present invention under 35 U.S.C. 102. Further discussion of this issue is found below in response to the Examiner’s rejection and more extensive discussion under 35 U.S.C. 103(a).

The “primary packaging” is stated to be a “cardboard” box material such as cellulosic fibers that is shaped into desired forms including corrugated
10 cardboard-type packages with the meaning of, for example, the claims 1, 36 (now cancelled) and 99. A disclosed composition is provided with an outer cover or envelope, and, thus, the fungal inoculant and seeds “are packaged separately from the cardboard box” materials within the meaning of claim 28 (now cancelled).

15 Applicant would note that Stensaas states the “primary packaging” may be a “cellulosic vehicle” or “paper product technology” (column 5, lines 24-26) or “corrugated cardboard-type package” (column 10, line 31), taking the form of a “ribbon, strap or slab” (column 6, lines 55-56), “fibrous package” (column 8, lines 20-24), “container or envelope” (column 8, lines 56-57), “capsules or
20 pellets” (column 10, lines 29-30) and “ribbon, strip or corrugated cardboard-type package” (column 10, line 31). However, Stensaas does not suggest or

even mention a “cardboard box.” Applicant would argue this is because Stensaas does not teach a cardboard container useful for carrying goods such as a cardboard box at all; instead Stensaas teaches a phosphorus fertilization system that incorporates cardboard, seeds and mycorrhizal spores or hyphae.

- 5 There is no motivation to use, suggestion to combine or teaching of a “cardboard box” because Stensaas does not in fact teach compositions such as a cardboard box useful for carrying goods.

Applicant would also note that Stensaas teaches the use of a “second package” or “secondary package” containing either rock phosphate or
10 phosphorus fertilizer (abstract, column 4, lines 34-47, column 12, lines 4-11, and column 13, lines 48-52). Thus Stensaas teaches away from the present invention, which Applicant would argue is both simpler, containing fewer elements, and directed to a different composition.

The office action further notes the delivery system may be dry, moist or
15 wet, incorporates glues, adhesives, etc., and teaches the concept of the cellulosic support matrix that is shaped into strips or cardboard packages being “infused” with the fungal inoculant. Applicant would agree, but would again note that the delivery system of Stensaas does not teach or suggest their application to a cardboard box, and thus does not anticipate the present
20 invention as claimed.

Applicant would respectfully argue that such does not anticipate a

container comprising a cardboard box capable of holding other goods. The reference discloses cardboard containing seeds and mycorrhizal spores; it does not disclose a cardboard box as a delivery system, not does it disclose saprophytic fungi. It is therefore respectfully requested that the rejections

5 under 35 U.S.C. § 102(b) be withdrawn.

Pending claims 27, 33, 34, 42, 43, 48, 98 and 99 remain rejected under 35 U.S.C. § 103(a) as being unpatentable over US 4,589,225 (Stensaas) taken with US 5,022,182 (Anderson) and Ineichen *et al.*, Changes in the fungus-specific, soluble carbohydrate pool during rapid and synchronous

10 ectomycorrhizal formation of *Picea abies* with *Pisolithus tinctorius*", Mycorrhiza, 1992, 2(1) pages 1-7.

US 4,589,225 (Stensaas) is relied upon as explained above for the disclosure of a mycotechnologies delivery system intended to benefit plant growth and to fertilize crops and other plants that comprises cellulosic matrix used for making cardboard packages, fungal inoculant of mycorrhizal microorganisms and plant seeds. The microorganisms and plant seeds combined with cardboard materials are generic as disclosed by US 4,589,225.

However, the reference by Ineichen *et al.* demonstrates that mycorrhizal microorganism such as *Pisolithus tinctorius* is capable to colonize cardboard materials and develop ectomycorrhizal on root systems of plans such as *Picea abies* (for example: see abstract). US 5,022,182 (Anderson) is relied upon to

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demonstrate incorporation of informational tags and indicators fabricated from cardboard into the delivery systems of seeds and plant fertilizers including beneficial microorganisms.

The office action states it would have been obvious to one having
5 ordinary skill in the art at the time the cardboard materials and boxes for delivery of mycotechnology systems as taught, suggested and adequately demonstrated by the cited prior art. Thus, it is stated, the claimed invention as a whole was clearly *prima facie* obvious.

Applicant would note that 5,022,182 (Anderson) simply discloses that the
10 baglike receptacle (column 7, lines 11-12), containing seeds, seedlings, urea-formaldehyde fertilizers and/or mycorrhizae, which can be fabricated from a variety of papers (column 7, lines 41-43), has a tag or indicator preferably fabricated from plastic or a plastic-coated cardboard (column 8, lines 14-17). There is no teaching, suggestion or motivation with regards to a cardboard box.
15 Ineichen *et al.* simply teaches cardboard with limiting glucose supply as a substrate for cultivation by the ectomycorrhizal fungi *Pisolithus tinctorius* prior to contact with seedling roots in the disclosed culture system. Again, there is no teaching, suggestion or motivation with regard to a cardboard box.

Applicant would again respectfully submit that none of the cited
20 references suggest, teach or would motivate one skilled in the art to adopt a “box”; the word “box” is not even used in the cited prior art. None of the

references is directed to even a "boxlike" container. Whereas the presently claimed invention could hold numerous embodiments of the cited inventions, none of the cited inventions is meant to hold more than the seeds or seedlings, mycorrhizal spores and the additional elements disclosed in the references

5 cited. One skilled in the art would expect the embodiments of Stensaas, Anderson and Ineichen *et al.* to be shipped in a box, not to be a box or be incorporated in a box, as there is no suggestion, teaching or motivation demonstrated in the prior art for a box.

None of the references teaches a "cardboard box" or "saprophytic fungi."

10 Each reference additionally teaches away from the present invention, requiring additional elements such as phosphorus fertilizer or rock phosphate (Stensaas), a baglike receptacle and urea-formaldehyde (Anderson) and a separate culture system and seedlings (Ineichen *et al.*). Clearly, as the references do not teach a cardboard box and saprophytic fungi, and as the
15 references teach away from the invention as claimed, the present invention would not be obvious to one skilled in the art based on these teachings.

In the Response to Arguments, the Examiner states "the instant claims as written are drawn to the use of a single fungal inoculant or "a fungal inoculant" selected from Markush group as claimed." The Examiner then
20 concludes "[t]he pending claims are not limited to any specific and mutually exclusive representatives of "saprophytic" and "mycorrhizal" fungal inoculants."

and further states the “mycorrhizal” fungi that colonize the plant roots and utilize fixed carbon from the plant photosynthates are also “saprophytic” fungi since they obtain nutrients from non-living matter in soil including decaying organic debris in soil,” for example organic phosphorus compounds.

5 However, in the claims as written, for example claim 27, the fungal inoculant is “of saprophytic and mycorrhizal fungi”; clearly both saprophytic fungi and mycorrhizal fungi are separate claim elements. The Markush group is simply directed to the type of inoculant, namely “spores, mycelium, powdered mushrooms and combinations thereof.” There is no requirement
10 under the patent statutes that specific and mutually exclusive representatives of saprophytic and mycorrhizal fungi be claimed; numerous examples are listed in the specification and would be known to those skilled in the art. Such a list of species might be included in dependent claims, but Applicant is under no requirement to more narrowly claim particular species. Most importantly, both
15 the specification and the art recognize and define mycorrhizal and saprophytic species as separate groups.

The specification as originally filed noted that mycorrhizal fungi are symbiotic with plants whereas saprophytic fungi live on wood and organic matter:

20 “For example, mycorrhizal fungi (including many mushroom fungi) form a mutually dependent, beneficial relationship with the roots of host plants, ranging from trees to grasses to agricultural crops. When the mycelia of these fungi form an exterior sheath covering

the roots of the plant they are termed ectomycorrhizal; when they invade the interior root cells of host plants they are called endomycorrhizal (also known as vesicular-arbuscular or VA mycorrhizae). Saprophytic fungi (wood and organic matter decomposers) are the primary decomposers in nature, working in concert with a succession of microorganisms and plants to break down and recycle organic and inorganic compounds and materials. Saprophytic fungi have also been found to form symbiotic, mutually beneficial relationship with a number of agricultural crops.”

(specification at page 2, line 16-page 3, line 7). The art of mycology also recognizes mycorrhizal and saprophytic as clearly separate and distinct. The Dictionary of Fungi (9th ed.), Kirk *et al.* (ed.), CAB International (2001), p. 341 defines “Mycorrhiza (pl. mycorrhizas, mycorrhizae) (fungus root). A symbiotic, non-pathogenic or feebly or weakly pathogenic association of a fungus and the roots of a plant. . . .” and goes on to extensively discuss Ectomycorrhiza, Vesicular-arbuscular and other mycorrhizal fungi. The same Dictionary at page 463 defines “Saprophyte, a plant feeding by external digestion of dead organic matter; commonly misapplied to fungi where saprobe (q.v.) is the preferred term.” Even 4,589,225 (Stensaas) recognizes that mycorrhizae are classified within a separate family, stating “[t]he fungal associations are formed by microorganisms belonging to the family Endogonaceae” which constitute two morphological groups, Ectomycorrhizae and Endomycorrhizae or vesicular-arbuscular mycorrhizae, which develop “symbiotic associations with roots of the plant root system” (column 1, lines 29-47). Mycorrhizal fungi are poor at decomposing organic matter compared to saprophytes and get the majority of

their sugars from plants through their roots, whereas saprophytes degrade cellulose, hemicellulose and lignin to form sugars. Mycorrhizal fungi offer little advantage for using cardboard boxes; saprophytic fungi give significant advantage by decomposing the cellulose matrix of the cardboard. Clearly,
5 mycorrhizal and saprophytic are separate and distinct elements in the claims, each of which must be rendered obvious by the references.

Only so far as the Examiner assumes a cardboard box is suggested, taught or motivated and ignores the teachings of the Stensaas, Anderson and Ineichen *et al.* references as a whole is it possible to abstract a cardboard box
10 incorporating saprophytic and mycorrhizal fungi and seeds. By doing this, the Examiner engages in improper picking and choosing.

“It is impermissible within the framework of 35 USC 103 to pick and choose from any one reference only so much of it as will support a given position to the exclusion of other parts necessary
15 to the full appreciation of what such reference fairly suggests to one skilled in the art.” *Bausch & Lomb, Inc. v. Barnes-Hind Hydrocurve, Inc.*, 230 U.S.P.Q.2d 416 (Fed. Cir. 1986).

Applicant would respectfully submit that the Examiner has engaged in
20 improper picking and choosing by selecting the separate elements and ignoring both clear teachings away from the claimed invention and what the references as a whole fairly suggest to one skilled in the art. Thus, by improper picking and choosing, the Examiner is reconstructing using impermissible hindsight to assemble a facsimile of applicant’s invention. This the Examiner is not
25 permitted to do. “It is impermissible to use the claims as a frame and the prior

art references as a mosaic to piece together a facsimile of the claimed invention.” *Uniroyal Inc. v. Rudkin-Wiley Corp.*, 837 F.2d 1044, 5 U.S.P.Q.2d 1434, 1438 (Fed. Cir. 1988). This type of selective reconstruction is strongly suggestive of impermissible hindsight.

5 “Selective hindsight is no more applicable to the design of experiments than it is to the combination of prior art teachings. There must be a reason or suggestion in the art for selecting the procedure used, other than the knowledge learned from applicant’s disclosure.” *In re Dow Chemical Co.*, 837 F.2d 469, 5 U.S.P.Q.2d
10 1529 (Fed. Cir. 1988).

Applicant would argue that beyond the selective hindsight, there is no suggestion to combine other than knowledge learned from applicant’s disclosure, the rejection merely stating that “it would have been obvious to one
15 having ordinary skill in the art. . . .”

It is therefore respectfully requested that the rejection under 35 U.S.C. § 103(a) be withdrawn.

In view of the amendment of claims and remarks above, it is submitted that the claims are in condition for allowance. Reconsideration and withdrawal
20 of the rejections and allowance of the claims is respectfully requested. The Examiner is invited to telephone the undersigned if a telephonic interview would expedite resolution of any remaining matters. Moreover, the Applicant and his attorney are willing to meet with the Examiner in person to further discuss allowance if necessary.

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Respectfully Submitted,

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Date

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